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growths in especially vigorous two or three year old white pine (*Pinus Strobus* L.) seedlings, in the nursery of the Yale Forest School; but also fully formed shoots, which, judging from the five leaves at their base, have clearly developed from such short growth buds.

Professor J. W. Toumey, of the Yale Forest School, states that he has seen, in the vicinity of New Haven, a large tree of *Pinus Strobus* L., which, as a result of some kind of injury, had developed a considerable number of its short growths into long growths.

Pinus excelsa Wall., from which the shoot illustrated was taken, is also a member of the white pine group. It is commonly known as the Bhotan pine, and is a native of the Himalayas. As far as the writer can ascertain, the abnormality under discussion has not been before recorded for this species. According to Penzig,* however, the phenomenon has been noted in *Pinus sylvestris* L. by several observers.

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THE DISTRIBUTION OF MACROCYSTIS PYRIFERA ALONG THE AMERICAN SHORE OF THE STRAIT OF JUAN DE FUCA

BY GEORGE B. RIGG

Setchell and Gardner† report *Macrocystis pyrifera* as extending northward "up to the Strait of Juan de Fuca" and state that "It does not seem to be plentiful in Puget Sound itself." They report a specimen collected by Gardner from the west coast of Whidby Island. Dr. Gardner states in a letter to the writer, that this was a floating specimen and that he did not find this species growing on the coast of Whidby Island.

Saunders,‡ in speaking of the distribution of this kelp in

* Penzig, O. Pflanzen-Teratologie 2: 497. Genoa. 1894.

† Setchell, W. A., and Gardner, N. L. Algae of Northwest America, University of California Press. Berkeley, 1903.

‡ Saunders, De Alton. Harriman Alaska Series of the Smithsonian Institution, Vol. V.

Alaska says that it occurs "in the elittoral zone off rocky points and in unprotected places." Setchell and Gardner (loc. cit.) say that they "have never found it growing in over 12 or 15 fathoms of water."

During the summers of 1911 and 1912 the writer visited, in the course of his work as special agent of the United States Department of Agriculture, practically all portions of the American shore of the Puget Sound region along which the conditions are at all suitable for the growth of large kelps. He has not been able to find *Macrocystis* growing anywhere in Puget Sound proper or in the American waters of the Strait of Georgia, or among the San Juan Islands. That is, he has not found it growing anywhere inside of the Strait of Juan de Fuca. This agrees with Setchell and Gardner's report.

Along the American shore of the Strait of Juan de Fuca the writer found extensive beds of *Macrocystis pyrifera* extending from Low Point to Cape Flattery—a distance of about 35 nautical miles. Low Point is at the mouth of the Lyre river a short distance west of Port Crescent, Washington.

In practically all cases, the beds of *Macrocystis* border those of *Nereocystis* and are nearer shore and hence in a little shallower water than the beds of *Nereocystis*. The longest specimens found measured 40 feet. Since the plants so measured reached the surface even at high tide and no specimens were measured unless they included the holdfast, it is evident, that the plant does not in this region grow to a depth of water at all approaching the maximum reported by Setchell and Gardner. The writer has not found a statement as to the minimum depth of water in which this species grows.

In the course of investigating the kelps of the Pacific Coast as a source of potash fertilizer, interest has been focused largely on *Macrocystis pyrifera*, *Nereocystis luetkeana*, and *Pelagophycus porra* because these are the three largest species found in the region and are all provided with floats that keep them at the surface of the water so that they may be harvested by machinery on a large scale.